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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/064,423	07/12/2002	Bingxue Shi	8853-US-PA	9330

31561 7590 03/09/2006

JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE  
7 FLOOR-1, NO. 100  
ROOSEVELT ROAD, SECTION 2  
TAIPEI, 100  
TAIWAN

EXAMINER

SCHAFER, JONATHAN C

ART UNIT PAPER NUMBER

2621

DATE MAILED: 03/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/064,423	<b>Applicant(s)</b> SHI ET AL.	
	<b>Examiner</b> Jonathan C. Schaffer	<b>Art Unit</b> 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 12 July 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-8 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### DETAILED ACTION

1. Applicant's response to the last Office Action, filed 07/12/2005, has been entered and made of record.
2. Applicant has amended claim 1. Claim 9 has been canceled. Claims 1-8 are currently pending.
3. Applicants arguments filed 07/12/2005 have been fully considered but they are not persuasive.
4. Applicant argues that Guoxing fails to disclose an extraction unit constructed of 24-cascaded cells to form a plurality of cell circuits and as a result, a 24-bit CCD extractor is NOT taught, suggested, or disclosed in Maeda either and thus claim 8 is patentable over Guoxing in view of Maeda. Further the applicant asserts that the "template matching circuit" of Guoxing is different from the applicant's "extraction unit". Additionally the applicant argues that Guoxing performs additional steps not claimed by the applicant.
5. In response, a 24 x 24 binary digit matrix is considered by the examiner to read on a 24 x 24 pixel feature and since the system of Guoxing would have to extract the image of the digit in some way the examiner used Maeda to illustrate the obviousness of using a CCD to perform the extraction process. Since the applicant has since amended the claims to include "24 cascaded cells to form a plurality of cell circuits" the examiner now cites Yang to teach the obviousness of the cascaded cell design of a CCD. Thus it would be obvious to extract using a 24 bit CCD in order to capture a 24 x 24 matrix with a cascaded cell architecture as that is a most common method known in the art. Claim 1 is thus unpatentable over Guoxing in view of Maeda, in further view of Yang. Further the applicant's assertion that the "template matching circuit" of Guoxing is different from the applicant's "extraction unit" is not found persuasive for the original and the aforementioned reasons. Additionally the applicant's argument that Guoxing's additional steps makes the applicant's invention patentable different is not found persuasive and thus Guoxing still reads on the applicant's claimed invention.

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6. All remaining arguments are reliant on the aforementioned and addressed arguments and thus are considered to be wholly addressed herein.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guoxing (0-7803-4859-1/98 IEEE "A modified Current Mode Hamming Neural Network for Totally Unconstrained Handwritten Numeral Recognition"), in view of Maeda (U.S. Patent Number 4,752,957), and further in view of Yang et al. (U.S. Patent Number 6,707,496).

***1. A handwritten numeral classifier using fuzzy logic and cellular neural network, comprising:***

***an extraction unit using cellular neural network for receiving a scanned image having a plurality of input features, wherein the extraction unit is constructed of 24 cascaded cells to form a plurality of cell circuits, and compressing the received data of the scanned image to generate a plurality of feature values;***

Guoxing discloses a classifier, which can be seen depicted in Fig. 1 the disclosed classifier which extracts the handwritten digit by scanning it in a 24 times 24 binary matrix which constitutes a 24bit extractor but Guoxing does not specifically indicate that it is a CCD which does the extracting. Maeda discloses a handwriting recognition system that uses a CCD extractor. Maeda

does not however disclose that the CCD extractor uses cascading cell architecture. Yang discloses a CCD with a cascading cell architecture, which is considered to have been, used in most prior art CCD cases. It would have been obvious at the time the invention was made to one of ordinary skill in the art to utilize the cascading cell architecture of Yang with the CCD extractor of Maeda and the classifier of Guoxing because it is a well know industry standard thus offering wide availability as well as a relatively low cost. The system disclosed is a Hamming neural network for classifying complex patterns such as totally unconstrained handwritten digits (pg. 1857, ¶ 1, l. 2-3). A hamming neural network can be a cellular neural network as it is just the method of calculating distances, hamming distances as it were, which is the number of bits in the input, which do not match the corresponding exemplar bits. The IEEE published article "The Cellular Neural Network Associative Processor" speaks of the use of Hamming Nets in Cellular Nets, therefor hamming neural networks and cellular neural networks will be considered synonymous for examination purposes. Guoxing also discloses a system in which 20 features are merged into 8 larger class features after that, those which have similar property are classified into on class feature, this is the first step of feature compression. (pg. 1858, ¶ 1, l. 18-21)

***a membership function generator using fuzzy logic for storing a plurality of membership functions and receiving the feature values to generate a plurality of synthesis membership function degrees for the plurality of input features;***

Guoxing discloses a system which uses fuzzy logic to store and generate a plurality of membership functions by placing scanned features which have similar properties into single classes and then putting those classes which are similar in still further classes. It does this operation in zones thus when one zone is finished it will finally give 8 binary outputs. (pg. 1859, ¶ 5, l. 1-4)

***a k-WTA circuit for receiving the plurality of synthesis membership function degrees from the membership function generator and outputting the synthesis membership degrees in order of magnitude;***

Guoxing discloses a k-WTA circuit (Fig. 4) that receives the plurality of membership function degrees and outputs them in order of magnitude, any one of the input ports can be regarded as a threshold input and its corresponding output is a reject signal. (pg. 1859, ¶ 5, l. 7-9)

***an I/O circuit for inputting programming codes to the membership function generator through off-chip memory units and receiving the synthesis membership degrees from the k-WTA circuit to output a final recognizing result of the scanned image;***

Guoxing discloses an I/O circuit Fig. 1 which allows for each bit of the template to be programmed. The I/O circuit can be seen to be receiving the synthesis membership degrees from the k-WTA circuit Fig.1.

***and a clock generator and logic controller for generating clock cycle and control logic signals for controlling timing of and logic for operations of the extraction unit, membership function generator, and the k-WTA circuit.***

Guoxing also discloses a clock generator and logic control which is linked to the extraction unit, the membership function generator and the k-WTA circuit as can be seen in Fig. 1.

***2. The classifier in claim 1, wherein the I/O circuit and the k-WTA circuit both have 11 corresponding ports.***

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Guoxing discloses a system which has both an I/O circuit and a k-WTA circuit and each of these circuits have 11 ports a piece as can be seen in Fig. 1.

**3. The classifier in claim 1, wherein the membership function generator further comprising:**

***a membership function generator array respectively corresponding to each one of the plurality of the input features for storing the plurality of membership functions and generating a plurality of current-type membership function degrees for the plurality of the input features,***

Guoxing discloses a membership function generator in which the input sub-patterns will be matched with a plurality of feature templates or membership functions which may include arcs, end points, crosslines, and corners (pg. 1858, ¶ 1, l. 5-9).

***and a plurality of switched-current integrator corresponding to the membership function generator array for receiving the plurality of membership function degrees and generating a plurality of synthesis membership degrees.***

Guoxing discloses a system which receives the membership function degrees or features and then merges them into larger class features. (pg. 1858, ¶ 1, l. 18-21)

**4. The classifier in claim 3, wherein the membership function generator array is 10.times.10.**

Guoxing discloses a membership function generator as addressed above which has 10 programmable templates fig. 1 with 10 possible values each thus defining a 10 times 10 array. (pg. 1858, ¶ 1, l. 31- 33)

***5. The classifier in claim 3, wherein the number of SI integrator includes 10.***

Guoxing discloses a system with 10 SI integrators Fig. 1.

***6. The classifier in claim 5, wherein each of the plurality of SI integrators includes a plurality of storage units constructed by a Regulated Gate Cascade structure.***

Guoxing discloses a system in which the switched current integrator with RGC (regulated-gate cascade) structure is adopted in the classifier the schematic of the integrator is depicted in Fig. 5. (pg. 1860, ¶ 1, l. 2-7)

***7. The extraction unit in claim 1, wherein the extraction unit further comprising:***

***a connected components detector extractor with a cellular neural network structure for speedily extracting the input features of a scanned numeral image;***

See claim 1 rejection. All of the components are connected for a speedy extraction. Fig. 1.

***and a compression unit for compressing bits of the input features into small and meaningful feature values and sending the compressed data to the membership function generator.***

See Fig. 1 and the rejection to claim 3.



**8. The classifier in claim 7, wherein the CCD extractor is 24 bits.**

See the rejection of Claim 1 first limitation.

### **Conclusion**

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

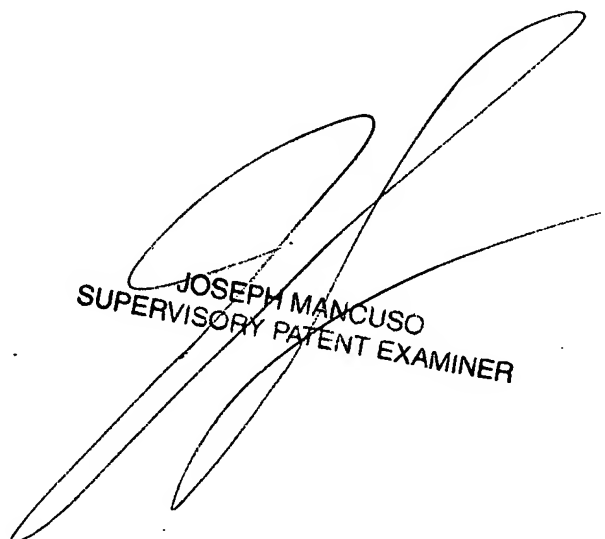
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jonathan C. Schaffer whose telephone number is (571)272-0603. The examiner can normally be reached on 7:30am - 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Mancuso can be reached on (571)272-7695. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JS



JOSEPH MANCUSO  
SUPERVISORY PATENT EXAMINER